

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings of claims in the application:

**Listing of Claims:**

Claim 1. (cancelled) A controlled release agricultural absorbent based product comprising:

particles of an absorbent material containing capillaries/voids between 10-200 microns in cross-sectional diameter which is impregnated in an amount of 40-95 % of the capillaries/voids volume with an agriculturally beneficial material selected from the group consisting of fertilizers, insecticides, herbicides and fungicides.

Claim 2. (cancelled) The controlled release agricultural absorbent based product of claim 1 wherein the absorbent material is selected from the group consisting of expanded perlite, shredded newspaper, saw dusts, cotton lint, ground corn cobs, corn cob flower, Metrecz absorbent and diatomaceous earth.

Claim 3. (cancelled) The controlled release agricultural absorbent based product of claim 1, wherein the capillaries and voids are between 40 and 100 microns in cross-sectional diameter.

Claim 4. (cancelled) The controlled release agricultural absorbent based product of claim 1, wherein the absorbent is impregnated in an amount of 70-95 % wt of the agricultural beneficial material.

Claim 5. (cancelled) The controlled release agricultural absorbent based product of claim 1, wherein the absorbent particles are 100-1500 microns in diameter.

Claim 6. (cancelled) The controlled release agricultural absorbent based product of claim 1, wherein the absorbent particles are 150-1000 microns in diameter.

Claim 7. (cancelled) The controlled release agricultural absorbent based product of claim 1, wherein the fertilizer is secondary nutrients selected from the group consisting of sulfur, calcium and magnesium.

Claim 8. (cancelled) The controlled release agricultural absorbent based product of claim 1, wherein the fertilizer is micronutrients selected from the group consisting of boron, copper, iron, manganese, molybdenum and zinc.

Claim 9. (cancelled) The controlled release agricultural absorbent based product of claim 1, wherein the fertilizer is selected from the group consisting of nitrogen compounds, phosphorous compounds and potassium compounds.

Claim 10. (cancelled) The controlled release agricultural absorbent based product of claim 9, wherein the nitrogen compounds are selected from the group consisting of urea, ammonia, ammonium nitrate, ammonium sulfate, calcium nitrate, diammonium phosphate, monoammonium phosphate, potassium nitrate and sodium nitrate.

Claim 11. (cancelled) The controlled release agricultural absorbent based product of claim 9, wherein the phosphorous compounds are selected from the group consisting of diammonium phosphate, monoammonium phosphate, monopotassium phosphate, dipotassium phosphate, tetrapotassium pyrophosphate, and potassium metaphosphate.

Claim 12. (cancelled) The controlled release agricultural absorbent based product of claim 9, wherein the potassium compound is selected from the group consisting of potassium chloride, potassium nitrate, potassium sulfate, monopotassium phosphate, dipotassium phosphate, tetrapotassium pyrophosphate, and potassium metaphosphate.

Claim 13. (cancelled) The controlled release agricultural absorbent based product of claim 9, wherein the fertilizer contains nitrogen, phosphorous and potassium compounds in a ratio selected from the group consisting of 29-3-4, 16-4-8, 10-10-10, 15-5-10, 15-0-15, 22-3-14, 20-28-5 and 12-6-6.

Claim 14. (cancelled) The controlled release agricultural absorbent based product of claim 1, wherein the fertilizer is a nitrification regulator selected from the group consisting of 2-chloro-6 trichloromethyl)pyridine, sulfathiazole, dicyandiamide, thiourea, and guanylthiourea.

Claim 15. (original) A controlled release agricultural absorbent based product comprising:  
particles of an absorbent material containing capillaries/voids between 10-200 microns in cross-sectional diameter which is impregnated in an amount of 40-95 % of the capillaries/voids volume with an agriculturally beneficial material selected from the group consisting of fertilizers, insecticides, herbicides and fungicides, said particles of absorbent material being agglomerated into granules.

Claim 16. (original) The controlled release agricultural absorbent based product of claim 15 wherein the particles are agglomerated into granules having a size of 0.2 – 25 mm in diameter.

Claim 17. (original) The controlled release agricultural absorbent based product of claim 15 wherein the particles are agglomerated into granules having a size of 1 – 4 mm in diameter.

Claim 18. (original) The controlled release agricultural absorbent based product of claim 15 wherein the absorbent material is selected from the group consisting of expanded perlite, shredded newspaper, saw dusts, cotton lint, ground corn cobs, corn cob flower, Metrecz absorbent and diatomaceous earth.

Claim 19. (original) The controlled release agricultural absorbent based product of claim 15, wherein the capillaries and voids are between 40 and 100 microns in cross-sectional diameter.

Claim 20. (original) The controlled release agricultural absorbent based product of claim 15, wherein the absorbent is impregnated in an amount of 70-95 % wt of the agricultural beneficial material.

Claim 21. (original) The controlled release agricultural absorbent based product of claim 15, wherein the absorbent particles are 100-1500 microns in diameter.

Claim 22. (original) The controlled release agricultural absorbent based product of claim 15, wherein the absorbent particles are 150-1000 microns in diameter.

Claim 23. (original) The controlled release agricultural absorbent based product of claim 15, wherein the fertilizer is secondary nutrients selected from the group consisting of sulfur, calcium and magnesium.

Claim 24. (original) The controlled release agricultural absorbent based product of claim 15, wherein the fertilizer is micronutrients selected from the group consisting of boron, copper, iron, manganese, molybdenum and zinc.

Claim 25. (original) The controlled release agricultural absorbent based product of claim 15, wherein the fertilizer is selected from the group consisting of nitrogen compounds, phosphorous compounds and potassium compounds.

Claim 26. (original) The controlled release agricultural absorbent based product of claim 25, wherein the nitrogen compounds are selected from the group consisting of urea, ammonia, ammonium nitrate, ammonium sulfate, calcium nitrate, diammonium phosphate, monoammonium phosphate, potassium nitrate and sodium nitrate.

Claim 27. (original) The controlled release agricultural absorbent based product of claim 25, wherein the phosphorous compounds are selected from the group consisting of diammonium phosphate, monoammonium phosphate, monopotassium phosphate, dipotassium phosphate, tetrapotassium pyrophosphate, and potassium metaphosphate.

Claim 28. (original) The controlled release agricultural absorbent based product of claim 25, wherein the potassium compound is selected from the group consisting of potassium chloride, potassium nitrate, potassium sulfate, monopotassium phosphate, dipotassium phosphate, tetrapotassium pyrophosphate, and potassium metaphosphate.

Claim 29. (original) The controlled release agricultural absorbent based product of claim 25, wherein the fertilizer contains nitrogen, phosphorous and potassium compounds in a ratio selected from the group consisting of 29-3-4, 16-4-8, 10-10-10, 15-5-10, 15-0-15, 22-3-14, 20-28-5 and 12-6-6.

Claim 30. (previously presented) The controlled release agricultural absorbent based product of claim 15, wherein the fertilizer is a growth regulator selected from the group consisting of potassium azide, 2 amino-4-chloro-6-methyl pyrimidine, N-2, 5-dicorphenyl succinamide, 4-amino-1, and 2,4-triazole hydrochloride.

Claim 31. (original) The controlled release agricultural absorbent based product of claim 15, wherein the fertilizer is a nitrification regulator selected from the group consisting of 2-chloro-6 trichloromethyl)pyridine, sulfathiazole, dicyandiamide, thiourea, and guanylthiourea.

Claim 32. (original) The controlled release agricultural absorbent based product of claim 15, wherein the insecticide is 0,0-diethyl O-(2-isopropyl-6 methyl- 4 pyrimidinyl) phosphorothioate).

Claim 33. (original) The controlled release agricultural absorbent based product of claim 15, wherein the herbicide is 2,4-dichlorophenoxyacetic acid.

Claim 34. (original) The controlled release agricultural absorbent based product of claim 15, wherein the fungicide is ferric-di-methyl-dithiocarbamate.

Claim 35. (currently amended) A controlled release agricultural absorbent based product comprising:  
a particulate absorbent material containing capillaries/voids between 10-200 microns in cross-sectional diameter which is impregnated in an amount of 40-95 % of the capillaries/voids volume with a mixture of an interspatial blocker and an agriculturally beneficial material selected from the group consisting of fertilizers, insecticides, herbicides and fungicides, wherein the particles of particulate absorbent material are agglomerated into granules.

Claim 36. (original) The controlled release agricultural absorbent based product of claim 35 wherein the interspatial blocker is a material selected from the group



consisting of plant starches, protein gels, glues, gumming compositions, crystallizing compounds, gelling clays, and synthetic gel forming compounds.

Claim 37. (original) The controlled release agricultural absorbent based product of claim 35 wherein the interspatial blocker is a starch selected from the group consisting of corn starch, rice starch, potato starch, wheat starch, tapioca starch, starch containing D-glucopyranose polymers, amylose and amylopectin. starch acetates, starch esters, starch ethers, starch phosphates

Claim 38. (original) The controlled release agricultural absorbent based product of claim 35 wherein the interspatial blocker is corn starch or wheat starch.

Claim 39. (original) The controlled release agricultural absorbent based product of claim 35 wherein the starches are modified by acetylation, chlorination, acid hydrolysis or enzymatic action.

Claim 40. (original) The controlled release agricultural absorbent based product of claim 35 wherein the interspatial blocker is a starch selected from the group consisting of starch acetates, starch esters, starch ethers and starch phosphates.

Claim 41. (original) The controlled release agricultural absorbent based product of claim 35 wherein the interspatial blocker is a gelatin made by hydrolysis of collagen.

Claim 42. (original) The controlled release agricultural absorbent based product of claim 35 wherein the interspatial blocker is a glue made from a material selected from the group consisting of collagen, casein, blood and vegetable protein.

Claim 43. (original) The controlled release agricultural absorbent based product of claim 35 wherein the interspatial blocker is a gumming composition selected from the group consisting of cellulose, rubber latex, gums, terpene resins, mucilages, asphalts, pitches and hydrocarbon resins.

Claim 44. (original) The controlled release agricultural absorbent based product of claim 35 wherein the interspatial blocker is a crystallizing compound selected from the group consisting of sodium silicate, phosphate cements, calcium-oxide cements and hydraulic cements.

Claim 45. (original) The controlled release agricultural absorbent based product of claim 35 wherein the interspatial blocker is a gelling clay.

Claim 46. (original) The controlled release agricultural absorbent based product of claim 35 wherein the interspatial blocker is a synthetic gel forming compound selected from the group consisting of polysulfide sealants, polyethylene, isobutylene, polyamides, polyvinyl acetate, epoxy, phenolformaldehyde, urea formaldehyde, polyvinyl butyral, cyanoacrylates and silicone cements.

Claim 47. (original) The controlled release agricultural absorbent based product of claim 35 wherein the interspatial blocker is present in an amount of 0.01 – 20 % wt.

Claim 48. (original) The controlled release agricultural absorbent based product of claim 35 wherein the interspatial blocker is present in an amount of 0.2-10 % wt.

Claim 49. (original) The controlled release agricultural absorbent based product of claim 35 wherein the interspatial blocker is present in an amount of 0.5-4 % wt.

Claim 50. (currently amended) A controlled release agricultural absorbent based product comprising:  
particles of expanded perlite as an absorbent material, containing capillaries/voids between 10-200 microns in cross-sectional diameter, which is impregnated in an

amount of 40-95 % of the capillaries/voids volume with an agriculturally beneficial material selected from the group consisting of fertilizers, insecticides, herbicides and fungicides, wherein the particles of expanded perlite are agglomerated into granules.

Claim 51. (cancelled) The controlled release agricultural absorbent based product of claim 50 wherein the particles are agglomerated into granules.

Claim 52. (original) The controlled release agricultural absorbent based product of claim 50 wherein the particles are agglomerated into granules having a size of 0.2 – 25 mm in diameter.

Claim 53. (original) The controlled release agricultural absorbent based product of claim 50 wherein the particles are agglomerated into granules having a size of 1 – 4 mm in diameter.

Claim 54. (original) The controlled release agricultural absorbent based product of claim 50 wherein the perlite is exfoliated perlite.

Claim 55. (original) The controlled release agricultural absorbent based product of claim 50 wherein the fertilizer is urea and the resulting absorbent contains 40-45 % wt. nitrogen.

Claim 56. (original) The controlled release agricultural absorbent based product of claim 50 wherein the fertilizer is urea and the resulting absorbent contains 43-44 % wt. nitrogen.

Claim 57. (original) The controlled release agricultural absorbent based product of claim 50 wherein the fertilizer is urea and the resulting absorbent has a bulk density of 25-43 lb/ft<sup>3</sup>.

Claim 58. (original) The controlled release agricultural absorbent based product of claim 50 wherein the fertilizer is urea and the resulting absorbent has a bulk density of 38-46 lb/ft<sup>3</sup>.

Claim 59. (currently amended) A controlled release agricultural absorbent based product comprising:  
particles of expanded perlite as an absorbent material, containing capillaries/voids between 10-200 microns in cross-sectional diameter, which is impregnated in an amount of 40-95 % of the capillaries/voids volume with a mixture of an interspatial blocker and an agriculturally beneficial material selected from the group consisting of fertilizers, insecticides, herbicides and fungicides, wherein the particles of expanded perlite are agglomerated into granules.

Claim 60. (cancelled) The controlled release agricultural absorbent based product of claim 59 wherein the particles are agglomerated into granules.

Claim 61. (original) The controlled release agricultural absorbent based product of claim 59 wherein the particles are agglomerated into granules having a size of 0.2 – 25 mm in diameter.

Claim 62. (original) The controlled release agricultural absorbent based product of claim 59 wherein the particles are agglomerated into granules having a size of 1 – 4 mm in diameter.

Claim 63. (original) A controlled release agricultural absorbent based product comprising:  
particles of exfoliated perlite as an absorbent material, containing capillaries/voids between 10-200 microns in cross-sectional diameter, which is impregnated in an amount of 40-95 % of the capillaries/voids volume with a mixture of an interspatial blocker and an agriculturally beneficial material selected from the group consisting of fertilizers, insecticides, herbicides and fungicides.

Claim 64. (original) The controlled release agricultural absorbent based product of claim 63 wherein the particles are agglomerated into granules.

Claim 65. (original) The controlled release agricultural absorbent based product of claim 63 wherein the particles are agglomerated into granules having a size of 0.2 – 25 mm in diameter.

Claim 66. (original) The controlled release agricultural absorbent based product of claim 63 wherein the particles are agglomerated into granules having a size of 1 – 4 mm in diameter.

Claim 67. (original) The controlled release agricultural absorbent based product of claim 63 wherein the exfoliated perlite has a loose weight density of 2-20 lb/ft<sup>3</sup>.

Claim 68. (original) The controlled release agricultural absorbent based product of claim 63 wherein the exfoliated perlite has a loose weight density of 2-6 lb/ft<sup>3</sup>.

Claim 69. (original) A controlled release agricultural absorbent based product comprising:  
particulate exfoliated perlite as an absorbent material, containing capillaries/voids between 10-200 microns in cross-sectional diameter, which is impregnated in an amount of 40-95 % of the capillaries/voids volume with a mixture of a vegetable starch and an agriculturally beneficial material selected from the group consisting of fertilizers,

insecticides, herbicides and fungicides, said particles of exfoliated perlite being agglomerated into granules.

Claim 70. (original) The controlled release agricultural absorbent based product of claim 69 wherein the granules have a size of 0.2 – 25 mm in diameter.

Claim 71. (original) The controlled release agricultural absorbent based product of claim 69 wherein the granules have a size of 1 – 4 mm in diameter.

Claim 72. (original) The controlled release agricultural absorbent based product of claim 69, wherein the fertilizer is selected from the group consisting of nitrogen compounds, phosphorous compounds and potassium compounds.

Claim 73. (original) The controlled release agricultural absorbent based product of claim 72, wherein the nitrogen compounds are selected from the group consisting of urea, ammonia, ammonium nitrate, ammonium sulfate, calcium nitrate, diammonium phosphate, monoammonium phosphate, potassium nitrate and sodium nitrate.

Claim 74. (original) The controlled release agricultural absorbent based product of claim 72, wherein the phosphorous compounds are selected from the group consisting of diammonium phosphate, monoammonium phosphate, monopotassium



phosphate, dipotassium phosphate, tetrapotassium pyrophosphate, and potassium metaphosphate.

Claim 75. (original) The controlled release agricultural absorbent based product of claim 72, wherein the potassium compound is selected from the group consisting of potassium chloride, potassium nitrate, potassium sulfate, monopotassium phosphate, dipotassium phosphate, tetrapotassium pyrophosphate, and potassium metaphosphate.

Claim 76. (original) The controlled release agricultural absorbent based product of claim 72, wherein the fertilizer contains nitrogen, phosphorous and potassium compounds in a ratio selected from the group consisting of 29-3-4, 16-4-8, 10-10-10, 15-5-10, 15-0-15, 22-3-14, 20-28-5 and 12-6-6.

Claim 77. (original) The controlled release agricultural absorbent based product of claim 69 wherein the fertilizer is urea and the resulting absorbent contains 40-45 % wt. nitrogen.

Claim 78. (original) The controlled release agricultural absorbent based product of claim 69 wherein the fertilizer is urea and the resulting absorbent contains 43-44 % wt. nitrogen.

Claim 79. (original) The controlled release agricultural absorbent based product of claim 69 wherein the fertilizer is urea and the resulting absorbent has a bulk density of 25-43 lb/ft<sup>3</sup>.

Claim 80. (original) The controlled release agricultural absorbent based product of claim 69 wherein the fertilizer is urea and the resulting absorbent has a bulk density of 38-46 lb/ft<sup>3</sup>.

Claim 81. (original) The controlled release agricultural absorbent based product of claim 69 wherein the vegetable starch is present in an amount of 0.01 – 20 % wt.

Claim 82. (original) The controlled release agricultural absorbent based product of claim 69 wherein the vegetable starch is present in an amount of 2 – 8 % wt.

Claim 83. (original) The controlled release agricultural absorbent based product of claim 69 wherein the vegetable starch is present in an amount of 0.5 – 4 % wt.

Claim 84. (original) The controlled release agricultural absorbent based product of claim 69 wherein the vegetable starch is selected from the group consisting of corn starch, rice starch, potato starch, wheat starch and tapioca starch.

Claim 85. (original) The controlled release agricultural absorbent based product of claim 69 wherein the vegetable starch is corn starch or wheat starch.

Claim 86. (original) The controlled release agricultural absorbent based product of claim 69 wherein the perlite is impregnated in an amount of 60-90 % of the capillaries/voids volume.

Claim 87. (original) The controlled release agricultural absorbent based product of claim 69 wherein the perlite is impregnated in an amount of 80-90 % of the capillaries/voids volume.

Claim 88. (original) The controlled release agricultural absorbent based product of claim 69 wherein the exfoliated perlite has a loose weight density of 2-20 lb/ft<sup>3</sup>.

Claim 89. (original) The controlled release agricultural absorbent based product of claim 69 wherein the exfoliated perlite has a loose weight density of 2-6 lb/ft<sup>3</sup>.

Claim 90. (original) The controlled release agricultural absorbent based product of claim 69 wherein the hardness of the granules is 8-10 lbs of force for granules of 2.8 – 3.4 mm diameter.

Claim 91. (original) The controlled release agricultural absorbent based product of claim 69 wherein the hardness of the granules is 0.9-1.1 lbs of force to 11-14 lbs of force for granules of 1-4 mm diameter.

Claim 92. (original) The controlled release agricultural absorbent based product of claim 69, wherein the fertilizer is secondary nutrients selected from the group consisting of sulfur, calcium and magnesium.

Claim 93. (original) The controlled release agricultural absorbent based product of claim 69, wherein the fertilizer is micronutrients selected from the group consisting of boron, copper, iron, manganese, molybdenum and zinc.

Claim 94. (original) The controlled release agricultural absorbent based product of claim 69, wherein the fertilizer is a growth regulator selected from the group consisting of potassium azide, 2 amino-4-chloro-6-methyl pyrimidine, N-2, 5-dicorphenyl succinamide, 4-amino-1, and 2,4-triazole hydrochloride.

Claim 95. (original) The controlled release agricultural absorbent based product of claim 69, wherein the fertilizer is a nitrification regulator selected from the group consisting of 2-chloro-6 trichloromethyl)pyridine, sulfathiazole, dicyandiamide, thiourea, and guanylthiourea.

Claim 96. (original) The controlled release agricultural absorbent based product of claim 69, wherein the insecticide is 0,0-diethyl O-(2-isopropyl-6 methyl- 4 pyrimidinyl) phosphorothioate).

Claim 97. (original) The controlled release agricultural absorbent based product of claim 69, wherein the herbicide is 2,4-dichlorophenoxyacetic acid.

Claim 98. (original) The controlled release agricultural absorbent based product of claim 69, wherein the fungicide is ferric-di-methyl-dithiocarbamate.

Claim 99. (original) A controlled release agricultural product comprising:  
a mixture of a control release holding substance selected from the group consisting of plant starches, protein gels, glues, gumming compositions, crystallizing compounds, gelling clays and synthetic gel forming compounds;  
and an agriculturally beneficial material selected from the group consisting of fertilizers, insecticides, herbicides and fungicides, said agricultural product being in a particulate form.

Claim 100. (original) The controlled release agricultural product of claim 99 wherein the holding substance is 4-8% wt of the agricultural product.

Claim 101. (original) The controlled release agricultural product of claim 99 wherein the holding substance is a starch selected from the group consisting of corn starch, rice starch, potato starch, wheat starch, tapioca starch, starch containing D-glucopyranose polymers, amylose and amylopectin. starch acetates, starch esters, starch ethers, starch phosphates

Claim 102. (original) The controlled release agricultural product of claim 99 wherein the interspatial blocker is corn starch or wheat starch.

Claim 103. (original) The controlled release agricultural product of claim 99 wherein the starches are modified by acetylation, chlorination, acid hydrolysis or enzymatic action.

Claim 104. (original) The controlled release agricultural product of claim 99 wherein the holding substance is a starch selected from the group consisting of starch acetates, starch esters, starch ethers and starch phosphates.

Claim 105. (original) The controlled release agricultural product of claim 99 wherein the holding substance is a gelatin made by hydrolysis of collagen.

Claim 106. (original) The controlled release agricultural product of claim 99 wherein the holding substance is a glue made from a material selected from the group consisting of collagen, casein, blood and vegetable protein.

Claim 107. (original) The controlled release agricultural product of claim 99 wherein the holding substance is a gumming composition selected from the group consisting of cellulose, rubber latex, gums, terpene resins, mucilages, asphalts, pitches and hydrocarbon resins.

Claim 108. (original) The controlled release agricultural product of claim 99 wherein the holding substance is a crystallizing compound selected from the group consisting of sodium silicate, phosphate cements, calcium-oxide cements and hydraulic cements.

Claim 109. (original) The controlled release agricultural product of claim 99 wherein the holding substance is a synthetic gel forming compound selected from the group consisting of polysulfide sealants, polyethylene, isobutylene, polyamides, polyvinyl acetate, epoxy, phenolformaldehyde, urea formaldehyde, polyvinyl butyral, cyanoacrylates and silicone cements.

Claim 110. (original) The controlled release agricultural product of claim 99 wherein the interspatial blocker is a gelling clay.

Claim 111. (original) The controlled release agricultural product of claim 99, wherein the fertilizer is secondary nutrients selected from the group consisting of sulfur, calcium and magnesium.

Claim 112. (original) The controlled release agricultural product of claim 99, wherein the fertilizer is micronutrients selected from the group consisting of boron, copper, iron, manganese, molybdenum and zinc.

Claim 113. (original) The controlled release agricultural product of claim 99, wherein the fertilizer is selected from the group consisting of nitrogen compounds, phosphorous compounds and potassium compounds.

Claim 114. (original) The controlled release agricultural product of claim 113, wherein the nitrogen compounds are selected from the group consisting of urea, ammonia, ammonium nitrate, ammonium sulfate, calcium nitrate, diammonium phosphate, monoammonium phosphate, potassium nitrate and sodium nitrate.

Claim 115. (original) The controlled release agricultural product of claim 113, wherein the phosphorous compounds are selected from the group consisting of diammonium phosphate, monoammonium phosphate, monopotassium phosphate, dipotassium phosphate, tetrapotassium pyrophosphate, and potassium metaphosphate.



Claim 116. (original) The controlled release agricultural product of claim 113, wherein the potassium compound is selected from the group consisting of potassium chloride, potassium nitrate, potassium sulfate, monopotassium phosphate, dipotassium phosphate, tetrapotassium pyrophosphate, and potassium metaphosphate.

Claim 117. (original) The controlled release agricultural product of claim 113, wherein the fertilizer contains nitrogen, phosphorous and potassium compounds in a ratio selected from the group consisting of 29-3-4, 16-4-8, 10-10-10, 15-5-10, 15-0-15, 22-3-14, 20-28-5 and 12-6-6.

Claim 118. (original) The controlled release agricultural product of claim 99, wherein the fertilizer is a growth regulator selected from the group consisting of potassium azide, 2 amino-4-chloro-6-methyl pyrimidine, N-2, 5-dicorphenyl succinamide, 4-amino-1, and 2,4-triazole hydrochloride.

Claim 119. (original) The controlled release agricultural product of claim 99, wherein the fertilizer is a nitrification regulator selected from the group consisting of 2-chloro-6 trichloromethyl)pyridine, sulfathiazole, dicyandiamide, thiourea, and guanylthiourea.

Claim 120. (original) The controlled release agricultural product of claim 99, wherein the insecticide is 0,0-diethyl O-(2-isopropyl-6 methyl- 4 pyrimidinyl) phosphorothioate).

Claim 121. (original) The controlled release agricultural product of claim 99, wherein the herbicide is 2,4-dichlorophenoxyacetic acid.

Claim 122. (original) The controlled release agricultural product of claim 99, wherein the fungicide is ferric-di-methyl-dithiocarbamate.

Claim 123. (original) A process for preparing a controlled release agricultural absorbent based product comprising the following steps:

introducing a predetermined amount of water to particles of absorbent material containing capillaries/voids between 10-200 microns in cross-sectional diameter, to result in absorption of water within the absorbent material;

heating the absorbent particles and water to transform the water within the absorbent particles to steam;

introducing the heated absorbent particles to an agriculturally beneficial material in aqueous solution selected from the group consisting of fertilizers, insecticides, herbicides and fungicides for blending to essentially saturate the absorbent particles with the agriculturally beneficial material;

granulating the combination of agriculturally beneficial material and saturated absorbent particles to solidify and harden the mixture within the absorbent particles and outside the particles, resulting in the agglomeration of absorbent particles into granules; and

drying the granules.

Claim 124. (original) The process of claim 123 wherein the combination of agriculturally beneficial material and saturated absorbent particles is heated while blending.

Claim 125. (original) The process of claim 123 wherein the granulated combination of agriculturally beneficial material and saturated absorbent particles is screened to result in granules of a predetermined diameter.

Claim 126. (original) The controlled release agricultural absorbent based product of claim 123 wherein the granules have a size of 0.2 – 25 mm in diameter.

Claim 127. (original) The process of claim 123 wherein undersized particles result from the screening step and are recycled back to the granulator where they agglomerate among themselves and among the incoming combination of agriculturally beneficial material and saturated absorbent particles.

Claim 128. (original) The process of claim 123 wherein the combination of agriculturally beneficial material and saturated absorbent particles is introduced into the granulator by spraying means.

Claim 129. (original) The process of claim 123 wherein the heating of the absorbent particles and water occurs in a heat exchanger.

Claim 130. (original) The process of claim 123 wherein the combination of agriculturally beneficial material and saturated absorbent particles are solidified and hardened by a loss of heat and/or increase of concentration of the agriculturally beneficial material.

Claim 131. (original) The process of claim 123 wherein the absorbent material is selected from the group consisting of expanded perlite, shredded newspaper, saw dusts, cotton lint, ground corn cobs, corn cob flower, Metrecz absorbent and diatomaceous earth.

Claim 132. (original) The process of claim 123, wherein the absorbent is impregnated in an amount of 70-95 % wt of the agricultural beneficial material.

Claim 133. (original) The process of claim 123, wherein the fertilizer is secondary nutrients selected from the group consisting of sulfur, calcium and magnesium.

Claim 134. (original) The process of claim 123, wherein the fertilizer is micronutrients selected from the group consisting of boron, copper, iron, manganese, molybdenum and zinc.

Claim 135. (original) The process of claim 123, wherein the fertilizer is selected from the group consisting of nitrogen compounds, phosphorous compounds and potassium compounds.

Claim 136. (original) The process of claim 135, wherein the nitrogen compounds are selected from the group consisting of urea, ammonia, ammonium nitrate, ammonium sulfate, calcium nitrate, diammonium phosphate, monoammonium phosphate, potassium nitrate and sodium nitrate.

Claim 137. (original) The process of claim 135, wherein the phosphorous compounds are selected from the group consisting of diammonium phosphate, monoammonium phosphate, monopotassium phosphate, dipotassium phosphate, tetrapotassium pyrophosphate, and potassium metaphosphate.

Claim 138. (original) The process of claim 135, wherein the potassium compound is selected from the group consisting of potassium chloride, potassium nitrate, potassium sulfate, monopotassium phosphate, dipotassium phosphate, tetrapotassium pyrophosphate, and potassium metaphosphate.

Claim 139. (original) The process of claim 135, wherein the fertilizer contains nitrogen, phosphorous and potassium compounds in a ratio selected from the group consisting of 29-3-4, 16-4-8, 10-10-10, 15-5-10, 15-0-15, 22-3-14, 20-28-5 and 12-6-6.

Claim 140. (original) The process of claim 123, wherein the fertilizer is a growth regulator selected from the group consisting of potassium azide, 2 amino-4-chloro-6-methyl pyrimidine, N-2, 5-dicorphenyl succinamide, 4-amino-1, and 2,4-triazole hydrochloride.

Claim 141. (original) The process of claim 123, wherein the fertilizer is a nitrification regulator selected from the group consisting of 2-chloro-6 trichloromethyl)pyridine, sulfathiazole, dicyandiamide, thiourea, and guanylthiourea.

Claim 142. (original) The controlled release agricultural absorbent based product of claim 123, wherein the insecticide is 0,0-diethyl O-(2-isopropyl-6 methyl- 4 pyrimidiny) phosphorothioate).

Claim 143. (original) The controlled release agricultural absorbent based product of claim 123, wherein the herbicide is 2,4-dichlorophenoxyacetic acid.

Claim 144. (original) The controlled release agricultural absorbent based product of claim 123, wherein the fungicide is ferric-di-methyl-dithiocarbamate.

Claim 145. (original) The process of claim 123 wherein the absorbent material is particles of perlite and the step of heating the absorbent particles and water to transform the water within the absorbent particles to steam, acts to exfoliate the perlite for improved subsequent adsorption of the agriculturally beneficial material.

Claim 146. (original) The process of claim 123 wherein the exfoliated perlite has a loose weight density of 2-20 lb/ft<sup>3</sup>.

Claim 147. (original) The process of claim 123 wherein the exfoliated perlite has a loose weight density of 2-6 lb/ft<sup>3</sup>.

Claim 148. (currently amended) A process for preparing a controlled release agricultural absorbent based product comprising the following steps:

introducing a predetermined amount of water to particles of absorbent material containing capillaries/voids between 10-200 microns in cross-sectional diameter, to result in absorption of water within the absorbent material;

heating the absorbent particles and water to transform the water within the absorbent particles to steam;

mixing an interspatial blocker material and an agriculturally beneficial material in aqueous solution selected from the group consisting of fertilizers, insecticides, herbicides and fungicides;

introducing the heated absorbent particles to the mixture of agriculturally beneficial material and interspatial blocker for blending ~~to essentially saturate~~ and for absorption by the absorbent particles ~~with~~ of the mixture of agriculturally beneficial material and interspatial blocker;

granulating the combination of agriculturally beneficial material, interspatial blocker and ~~saturated~~ absorbent particles to solidify and harden the mixture within the absorbent particles and outside the particles, resulting in the agglomeration of absorbent particles into granules; and

drying the granules.

Claim 149. (original) The process of claim 148 wherein the interspatial blocker is a material selected from the group consisting of plant starches, protein gels, glues, gumming compositions, crystallizing compounds, gelling clays, and synthetic gel forming compounds.

Claim 150. (original) The process of claim 148 wherein the interspatial blocker is a starch selected from the group consisting of corn starch, rice starch, potato starch,



wheat starch, tapioca starch, starch containing D-glucopyranose polymers, amylose and amylopectin. starch acetates, starch esters, starch ethers, starch phosphates

Claim 151. (original) The process of claim 148 wherein the interspatial blocker is corn starch or wheat starch.

Claim 152. (original) The process of claim 148 wherein the starches are modified by acetylation, chlorination, acid hydrolysis or enzymatic action.

Claim 153. (original) The process of claim 148 wherein the interspatial blocker is a starch selected from the group consisting of starch acetates, starch esters, starch ethers and starch phosphates.

Claim 154. (original) The process of claim 148 wherein the interspatial blocker is a gelatin made by hydrolysis of collagen.

Claim 155. (original) The process of claim 148 wherein the interspatial blocker is a glue made from a material selected from the group consisting of collagen, casein, blood and vegetable protein.

Claim 156. (original) The process of claim 148 wherein the interspatial blocker is a gumming composition selected from the group consisting of cellulosics, rubber latex, gums, terpene resins, mucilages, asphalts, pitches and hydrocarbon resins.

Claim 157. (original) The process of claim 148 wherein the interspatial blocker is a crystallizing compound selected from the group consisting of sodium silicate, phosphate cements, calcium-oxide cements and hydraulic cements.

Claim 158. (original) The process of claim 148 wherein the interspatial blocker is a synthetic gel forming compound selected from the group consisting of polysulfide sealants, polyethylene, isobutylene, polyamides, polyvinyl acetate, epoxy, phenolformaldehyde, urea formaldehyde, polyvinyl butyral, cyanoacrylates and silicone cements.

Claim 159. (original) The process of claim 148 wherein the interspatial blocker is a gelling clay.

Claim 160. (original) The process of claim 148 wherein the interspatial blocker is present in an amount of 0.01 – 20 % wt.

Claim 161. (original) The process of claim 148 wherein the interspatial blocker is present in an amount of 0.5 – 6 % wt.

Claim 162. (original) The process of claim 148 wherein the combination of agriculturally beneficial material and saturated absorbent particles is heated while blending.

Claim 163. (original) The process of claim 148 wherein the granulated combination of agriculturally beneficial material and saturated absorbent particles is screened to result in granules of a predetermined diameter.

Claim 164. (original) The process of claim 148 wherein the granules have a size of 0.2 – 25 mm in diameter.

Claim 165. (original) The process of claim 148 wherein undersized particles result from the screening step and are recycled back to the granulator where they agglomerate among themselves and among the incoming combination of agriculturally beneficial material and saturated absorbent particles.

Claim 166. (original) The process of claim 148 wherein the combination of agriculturally beneficial material and saturated absorbent particles is introduced into the granulator by spraying means.

Claim 167. (original) The process of claim 148 wherein the heating of the absorbent particles and water occurs in a heat exchanger.

Claim 168. (original) The process of claim 148 wherein the combination of agriculturally beneficial material and saturated absorbent particles are solidified and hardened by a loss of heat and/or increase of concentration of the agriculturally beneficial material.

Claim 169. (original) The process of claim 148 wherein the absorbent material is selected from the group consisting of expanded perlite, shredded newspaper, saw dusts, cotton lint, ground corn cobs, corn cob flower, Metrecz absorbent and diatomaceous earth.

Claim 170. (original) The process of claim 148 wherein the absorbent material is particles of perlite and the step of heating the absorbent particles and water to transform the water within the absorbent particles to steam, acts to exfoliate the perlite for improved subsequent adsorption of the agriculturally beneficial material.

Claim 171. (original) The process of claim 148, wherein the absorbent is impregnated in an amount of 70-95 % wt of the agricultural beneficial material.

Claim 172. (original) The process of claim 148, wherein the fertilizer is secondary nutrients selected from the group consisting of sulfur, calcium and magnesium.

Claim 173. (original) The process of claim 148, wherein the fertilizer is micronutrients selected from the group consisting of boron, copper, iron, manganese, molybdenum and zinc.

Claim 174. (original) The process of claim 148, wherein the fertilizer is selected from the group consisting of nitrogen compounds, phosphorous compounds and potassium compounds.

Claim 175. (original) The process of claim 174, wherein the nitrogen compounds are selected from the group consisting of urea, ammonia, ammonium nitrate, ammonium sulfate, calcium nitrate, diammonium phosphate, monoammonium phosphate, potassium nitrate and sodium nitrate.

Claim 176. (original) The process of claim 174, wherein the phosphorous compounds are selected from the group consisting of diammonium phosphate, monoammonium phosphate, monopotassium phosphate, dipotassium phosphate, tetrapotassium pyrophosphate, and potassium metaphosphate.

Claim 177. (original) The process of claim 174, wherein the potassium compound is selected from the group consisting of potassium chloride, potassium nitrate, potassium sulfate, monopotassium phosphate, dipotassium phosphate, tetrapotassium pyrophosphate, and potassium metaphosphate.

Claim 178. (original) The process of claim 174, wherein the fertilizer contains nitrogen, phosphorous and potassium compounds in a ratio selected from the group consisting of 29-3-4, 16-4-8, 10-10-10, 15-5-10, 15-0-15, 22-3-14, 20-28-5 and 12-6-6.

Claim 179. (original) The process of claim 148, wherein the fertilizer is a growth regulator selected from the group consisting of potassium azide, 2 amino-4-chloro-6-methyl pyrimidine, N-2, 5-dicorphenyl succinamide, 4-amino-1, and 2,4-triazole hydrochloride.

Claim 180. (original) The process of claim 148, wherein the fertilizer is a nitrification regulator selected from the group consisting of 2-chloro-6 trichloromethyl)pyridine, sulfathiazole, dicyandiamide, thiourea, and guanylthiourea.

Claim 181. (original) The process of claim 148, wherein the insecticide is 0,0-diethyl O-(2-isopropyl-6 methyl- 4 pyrimidiny) phosphorothioate).

Claim 182. (original) The process of claim 148, wherein the herbicide is 2,4-dichlorophenoxyacetic acid.

Claim 183. (original) The process of claim 148, wherein the fungicide is ferric-di-methyl-dithiocarbamate.

Claim 184. (original) The process of claim 148, wherein the steps of combining water and the absorbent particles and then heating the combined absorbent particles and water to transform the water within the absorbent particles to steam are replaced by the step of directly introducing hot steam to the absorbent particles in order to produce absorbent particles containing steam.

Claim 185. (currently amended) A process for preparing a controlled release agricultural product comprising the following steps:

mixing a control release holding substance selected from the group consisting of plant starches, protein gels, glues, gumming compositions, crystallizing compounds, gelling clays and synthetic gel forming compounds with an agriculturally beneficial material in aqueous solution selected from the group consisting of fertilizers, insecticides, herbicides and fungicides;

~~blending the mixture of agriculturally beneficial material and holding substance;~~

granulating the combination of agriculturally beneficial material and holding substance to solidify and harden the mixture, resulting in granules; and

drying the granules.

Claim 186. (currently amended) The process of claim ~~1185~~ 185 wherein the holding substance is a starch selected from the group consisting of corn starch, rice starch, potato starch, wheat starch, tapioca starch, starch containing D-glucopyranose polymers, amylose and amylopectin. starch acetates, starch esters, starch ethers, starch phosphates

Claim 187. (original) The process of claim 185 wherein the holding substance is corn starch or wheat starch.

Claim 188. (original) The process of claim 185 wherein the starches are modified by acetylation, chlorination, acid hydrolysis or enzymatic action.

Claim 189. (original) The process of claim 185 wherein the holding substance is a starch selected from the group consisting of starch acetates, starch esters, starch ethers and starch phosphates.

Claim 190. (original) The process of claim 185 wherein the holding substance is a gelatin made by hydrolysis of collagen.



Claim 191. (original) The process of claim 185 wherein the holding substance is a glue made from a material selected from the group consisting of collagen, casein, blood and vegetable protein.

Claim 192. (original) The process of claim 185 wherein the holding substance is a gumming composition selected from the group consisting of cellulose, rubber latex, gums, terpene resins, mucilages, asphalts, pitches and hydrocarbon resins.

Claim 193. (original) The process of claim 185 wherein the holding substance is a crystallizing compound selected from the group consisting of sodium silicate, phosphate cements, calcium-oxide cements and hydraulic cements.

Claim 194. (original) The process of claim 185 wherein the holding substance is a synthetic gel forming compound selected from the group consisting of polysulfide sealants, polyethylene, isobutylene, polyamides, polyvinyl acetate, epoxy, phenolformaldehyde, urea formaldehyde, polyvinyl butyral, cyanoacrylates and silicone cements.

Claim 195. (original) The process of claim 185 wherein the holding substance is a gelling clay.

Claim 196. (currently amended) The process of claim 185 wherein the combination of agriculturally beneficial material and holding substance is heated while ~~blending~~ mixing.

Claim 197. (original) The process of claim 185 wherein the granulated combination of agriculturally beneficial material and holding substance is screened to result in granules of a predetermined diameter.

Claim 198. (original) The process of claim 185 wherein the combination of agriculturally beneficial material and holding substance is introduced into the granulator by spraying means.

Claim 199. (cancelled) The process of claim 185 wherein the heating of the absorbent particles and water occurs in a heat exchanger.

Claim 200. (original) The process of claim 185 wherein the combination of agriculturally beneficial material and holding substance are solidified and hardened by a loss of heat and/or increase of concentration of the agriculturally beneficial material.

Claim 201. (new) A process for preparing a controlled release agricultural absorbent based product comprising the following steps:

introducing a predetermined amount of water to particles of expanded perlite as an absorbent material containing capillaries/voids between 10-200 microns in cross-sectional diameter, to result in absorption of water within the particles of expanded perlite;

exfoliating the particles of expanded perlite by heating the particles of expanded perlite and water to transform the water within the particles of expanded perlite to steam sufficient to rupture the outer surface of the particles of expanded perlite;

mixing an interspatial blocker material and an agriculturally beneficial material in aqueous solution selected from the group consisting of fertilizers, insecticides, herbicides and fungicides;

introducing the exfoliated particles of expanded perlite to the mixture of agriculturally beneficial material and interspatial blocker for blending and absorption of the mixture of agriculturally beneficial material and interspatial blocker by the particles;

granulating the combination of agriculturally beneficial material, interspatial blocker and absorbed exfoliated particles to solidify and harden the mixture within the absorbed particles and outside the particles, resulting in the agglomeration of particles into granules; and

drying the granules.

Claim 202. (new) A controlled release agricultural absorbent based product comprising:

a particulate absorbent material containing capillaries/voids between 10-200 microns in cross-sectional diameter which is impregnated in an amount of 40-95 % of the capillaries/voids volume with a mixture of an interspatial blocker and an agriculturally beneficial material selected from the group consisting of fertilizers, insecticides, herbicides and fungicides, wherein the interspatial blocker is selected from the group consisting of plant starches, protein gels, collagen based glues, casein based glues, blood based glues, vegetable protein based glues, rubber latex, gums, terpene resins, mucilages, asphalts, pitches, hydrocarbon resins, sodium silicate, phosphate cements, calcium-oxide cements, hydraulic cements, gelling clays and synthetic gel forming compounds.